Hearing Loss in NICU Infants

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Abstract

Objective: The National Institute of Health has recommended hearing screens to be administered on infants in the Neonatal Intensive Care Unit (NICU) prior to their discharge as they are more likely to develop hearing loss compared to non-NICU infants. Few studies have evaluated NICU infants with failed hearing screens at discharge, repeated failed screens and documented hearing loss to identify common risk factors.

Methods: In this cohort study, medical records were reviewed for demographic, clinical and laboratory data of infants admitted to the Albany Medical Center NICU from 1/1/12 to 6/1/13. During the study time period, 871 infants were screened by automated auditory brainstem response (AABR). The National Institute of Health has recommended hearing screens to be performed this universal hearing screen and record the results. Non-audiologists are able to perform this universal hearing screen and record the results. Non-audiologists are able to perform this universal hearing screen and record the results.

Results: During the study period, 871 infants were screened by automated auditory brainstem response (AABR). The level of significance was p<0.05 level.

Conclusions: Our study shows that infants with a dysmorphic syndrome are more likely to have a failed AABR and confirmed hearing loss. Repeated failed AABR but subsequent passing after a time interval may be a form of transient hearing loss. This could be measuring window treatments such as the use of insotropes and HFV are noted to be more common in the FS group but not the HL group. Infants with a failed AABR are more likely to have a confirmed hearing loss. The most common syndrome associated with hearing loss in our study was Down Syndrome. Parents of dysmorphic infants should be counseled about the possibility of hearing loss after a failed AABR.

Limitations

- Retrospective study that does not allow us to more rigorously track infants with failed AABR at discharge.
- Follow-up rate of 80% may limit the confidence in the conclusion of the study.

Acknowledgements

New York State Department of Health NYS Statewide Neonatal Critical Care System
Albany Medical Center, Department of Neonatology

Background

Infants in the Neonatal Intensive Care Unit (NICU) are ten times more likely to develop hearing loss compared to non-NICU infants. The Joint Committee on Infant Hearing in a 1994 Position Statement established the following risk factors for neonatal hearing loss: family history, in-utero infection, craniofacial anomalies, birth weight <1500 gm, hyperbilirubinemia, ototoxic medications, bacterial meningitis, low Apgars, mechanical ventilation or syndrome associated with SHH, and conductive hearing loss.

Several studies in the literature delineate some of the potential high-risk criteria seen in the NICU that may put these infants at increased risk. These studies have been done in various countries with different populations and varied criteria for not only NICU admission, but also neonatal viability and diagnosis management, particularly ventilator management. Extrapolation from these studies to other health care system patients has been difficult. Most studies from the United States have evaluated hearing in the normal newborn population. The few follow-up studies of failed hearing screens have been fraught with very low percentage of return visits.

Methods

Hearing Assessment Protocol

The two types of hearing tests done were the AABR and the diagnostic auditory brainstem response (DABR). The AABR is a screening tool in which waveforms are automatically evaluated using criteria set by the manufacturer. Non-audiologists are able to perform this universal hearing screen and record the results.

Conversely, the DABR is performed and results are evaluated by a certified audiologist. The DABR provides direct measurement of neural response to a generated sound.

Results

Hearing Evaluation Results

Pass

Fail (repeated prior to NICU discharge)

Encouraged to follow-up w/ audiology

No risk indicators

Screen with AABR

AABR: automated auditory brainstem response

DABR: diagnostic auditory brainstem response

FS: failed AABR screen

PH: passed hearing screen

HL: confirmed hearing loss

Methods

We reviewed the medical charts of 871 infants admitted to the AMC NICU over the 18 month period of 1/1/12-6/1/13. We excluded infants who were transferred out of the NICU or did not survive to discharge. The AMC NICU covers a 25 county area that includes eastern New York State from just north of New York City to the Canadian border and extending to central NYS.

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